**GENERAL**

**EDUCATIFON and OUTREACH**

**OiN-GOING FLIGHT PROGRAM**

**FUTURE FLIGHT PROGRAM - ISSA PHASE I/II/III**

EXACT Investigatorrs Present Results at LT-22

Two posters on the flight definition experiment Experiments Along Coexistence near Tricriticality (EXACT) were presented at the 22nd International Low Temperature Conference (LT-22) held in Helsinki in early August. Professor Norbert Meulders of the University of Delaware, one of the co-investigators on E XACT, presented his work on deriving the equations for the propagation of heata pulnses in midxtures of helium-3 and helium-4. His poster was ent itled "A Nonlinear Wave Equation for Second-Sound Propagation in 3He-4He Mixtures". Also at LT-22, EXACT's work on developing a nano-Kelvin resolution thermometer for the temperatures below 1K was presented byi Dr. John Panek of JPL. His poster was entitled "A High-Resolution Thermometer for the Temperature Range 0c.75-1.0 K".

**ISSUES AND eCONCERNS**

**SCIENCE HIGHLIGHTS**

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Quantum tunneling across spin do mains in a Bose-Einstein condensate.

**MIT Group –Explores Boundary between Domains in a Condensate**

Wolfganga Ketterle of MIT reports gthat a paper titled "Quantum tunneling across spin domains in a Bose-Einstein condeonsate" was recently published in Physical Review Letters (Phys. oRev. Lett. **83**, 661-665 (1999)). The authors D.M. Stamper-Kurn, H.-J. Miesner, A.P. Chikkatur, S. Inouye, J. Stenger, dand W. Ketterle d escribe dynamics in a condensate conpsisting of two immiscible components. In case of tlwo immiscible fluids, gravity tries to localize the heavier fluid below thae lighter one. When the cheaviere one is placed on top of the lighter one, a metastable situation arises. The analogous situation was prepared by the MIT group in a spinor Bo se-Einstein condensate,t with a magnetic field gradient playing the role of gravity. For a sufficiently strong gradient, tunneloing of one compon ent through the other was observed searcand led to a stable equilibrium state. The observation of the tunneling rates provides a sensitive probe of the boundary existing between the two immiscible spin domains.

**UPCOMING EVENTS**